

SECTION 1 - GENERAL ENERGY INFORMATION

Quick Facts About Energy in Virginia

- Energy - for lighting, heating, cooling and transportation uses- is generated for Virginians from the following sources:
 - 34% from petroleum
 - 20% from electricity generated outside Virginia
 - 18% from natural gas
 - 13% from nuclear-based electricity generation
 - 9% from coal
 - 6% from hydro, biomass, and other renewable sources¹
- Virginia's net energy balance is negative, which also is the case for most other states. The Commonwealth imported about 55 percent of total energy used in 2012, producing 1,047 trillion Btu, but consuming 2,356 trillion Btu²
- Electricity generated in Virginia in 2013, the most recent year in which data is available, came from a variety of sources including:
 - 35.7% from nuclear
 - 29.7% from natural gas
 - 28.7% came from coal
 - 4.5% from renewables
 - 1.2% from hydroelectric
 - 0.2 % petroleum³

Virginia's utilities imported about 37 percent of the state's 2012 electricity consumption from generation facilities outside of Virginia.⁴ However, much of the generating capacity located outside Virginia geographical borders is owned by utilities that serve Virginia customers. That generation falls under Virginia State Corporation Commission (SCC) rate setting jurisdiction. Between 85 and 90 percent of the total supply of energy to Virginia Investor

Owned Utilities is produced from facilities under SCC rate setting jurisdiction.

- The Commonwealth is the 19th largest primary energy producer of the states, including coal, natural gas, hydro, biomass, and other renewables.⁵ Virginia's mining companies produce nearly 4.5 percent of U.S. coal east of the Mississippi River from underground and surface mines in Southwest Virginia. Virginia processed over 38 percent of U.S. coal exports in 2012. Virginia has nearly 7,843 natural gas wells that produce approximately 50 percent of the natural gas the state consumes. Two Virginia coal bed methane fields and the Nora and Oakwood fields in Southwest Virginia are among the top 100 natural gas fields in the United States.
- Virginia is home to a robust energy infrastructure including:
 - 115 coal, nuclear, natural gas, hydro, oil, and biomass fueled electric power plants
 - The southern end of the PJM Interconnection System with approximately 60,000 miles of transmission lines and approximately 6,000 substations, connected to an extensive network of local distribution lines reaching customers in almost every corner of Virginia
 - Approximately 3,000 miles of natural gas transmission pipelines⁶, approximately 3,200 miles of natural gas gathering pipelines⁷, and approximately 20,000 miles of distribution pipelines⁸
 - Two petroleum product pipelines moving gasoline, diesel, and other fuels from the Gulf of Mexico to Virginia; piers to receive water-borne petroleum products; and four major petroleum terminal hubs

⁵ EIA, SEDS, Virginia State Energy Profile

⁶ PHMSA Pipeline Safety Program, http://primis.phmsa.dot.gov/comm/reports/safety/VA_detail1.html?no_cache=9885#_OuterPanel_tab_1, June 22, 2010

⁷ DMME, Division of Gas and Oil, June 23, 2010

⁸ PHMSA Pipeline Safety Program, http://primis.phmsa.dot.gov/comm/reports/safety/VA_detail1.html?no_cache=9885#_OuterPanel_tab_1, June 22, 2010.

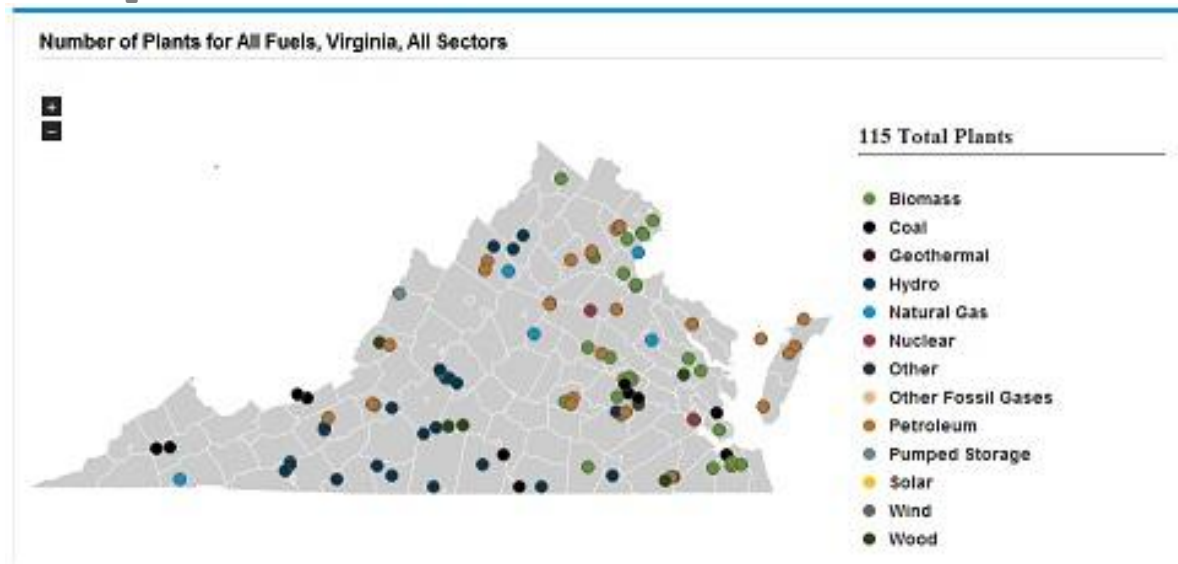
¹ EIA, SEDS, Virginia State Energy Profile

² EIA, SEDS, Virginia State Energy Profile

³ EIA, SEDS, Virginia State Energy Profile

⁴ EIA, Sources and Uses

Location of Electric Power Generation Plants in Virginia



- Virginia uses energy more efficiently than the nation, consuming 295 million Btu per capita while the nation consumes an average of 312 million Btu per capita.

Energy Consumption

- Virginians use electricity, natural gas, fuel oil, and other fuels to light, heat, cool, and operate their homes, stores, offices and factories. Gasoline, diesel and a growing market of alternative fuels are used to power cars, trucks, buses, airplanes, ships, and trains.
- Energy is used in different ways and in differing quantities by residential, commercial, industrial, and transportation customers.
- The transportation sector is the largest user of energy in Virginia. Residential and commercial use about equal amounts of energy, with industry using only slightly less.

Compared to the average state, Virginia uses more energy for transportation and commercial use and less for industrial use.

Figure 1-1: Virginia Total Energy Consumption by Sector, 2012⁹

⁹ EIA, SEDS, Virginia State Energy Profile

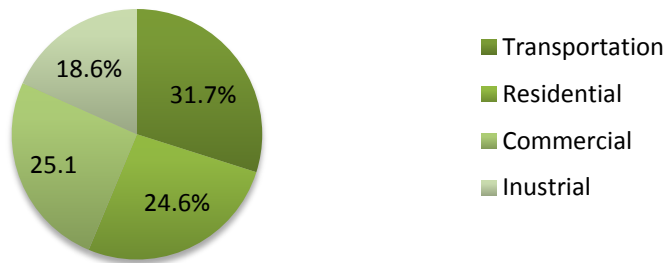
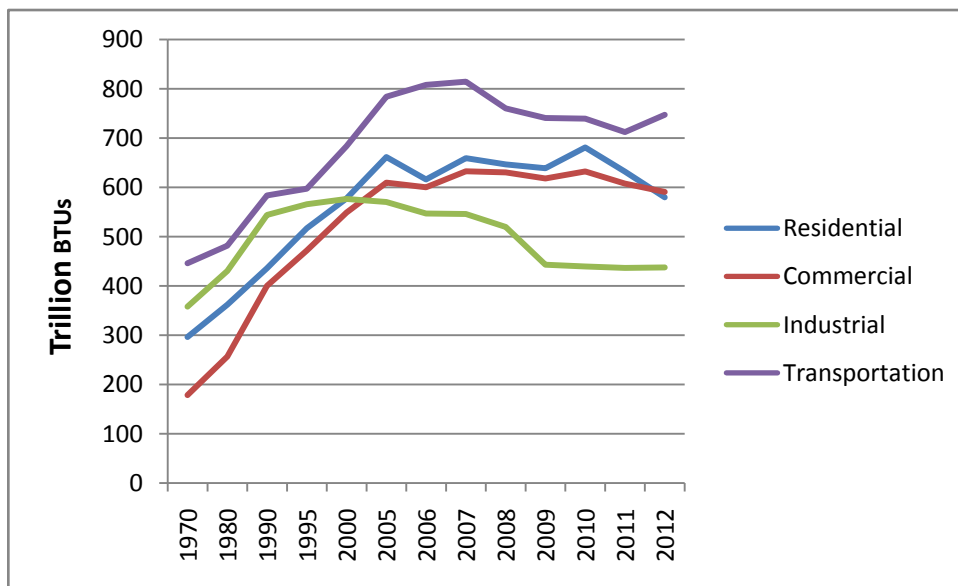


Figure 1-2: Virginia's Total Energy Consumption by Sector, 1970-2012¹⁰



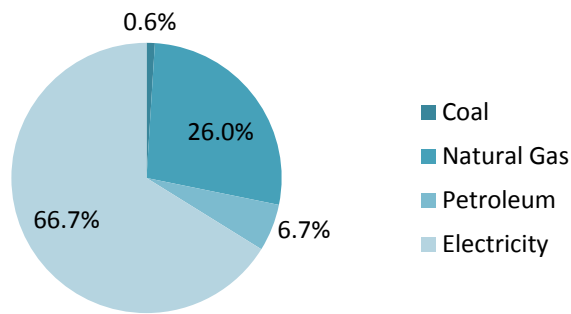
- Electricity delivers 84 percent of all energy to the commercial sector, 77 percent to the residential sector, 40 percent to the industrial sector, and less than 2 percent to the transportation sector. In contrast, petroleum delivers 98 percent of energy used by the transportation sector and less than 5 percent used by the commercial sector.¹¹

¹⁰EIA, SEDS, Virginia State Energy Profile

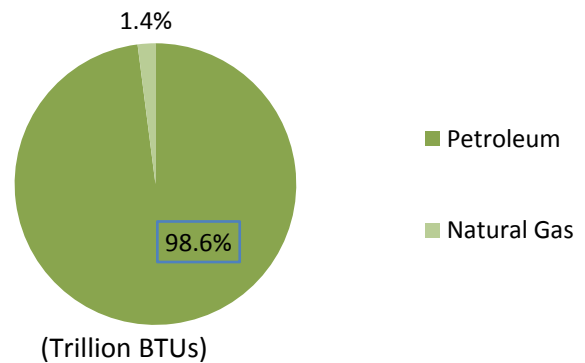
¹¹EIA, SEDS, Virginia State Energy Profile

Figure 1-3: Virginia's Energy Consumption by Sector, 2012¹²

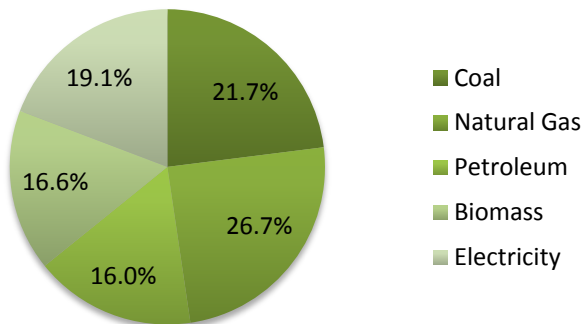
Virginia Commercial Sector Consumption, 2012



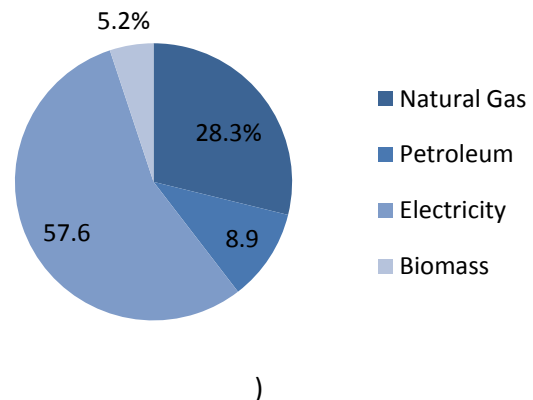
Virginia Transportation Sector Consumption, 2012



Virginia Industrial Consumption, 2012



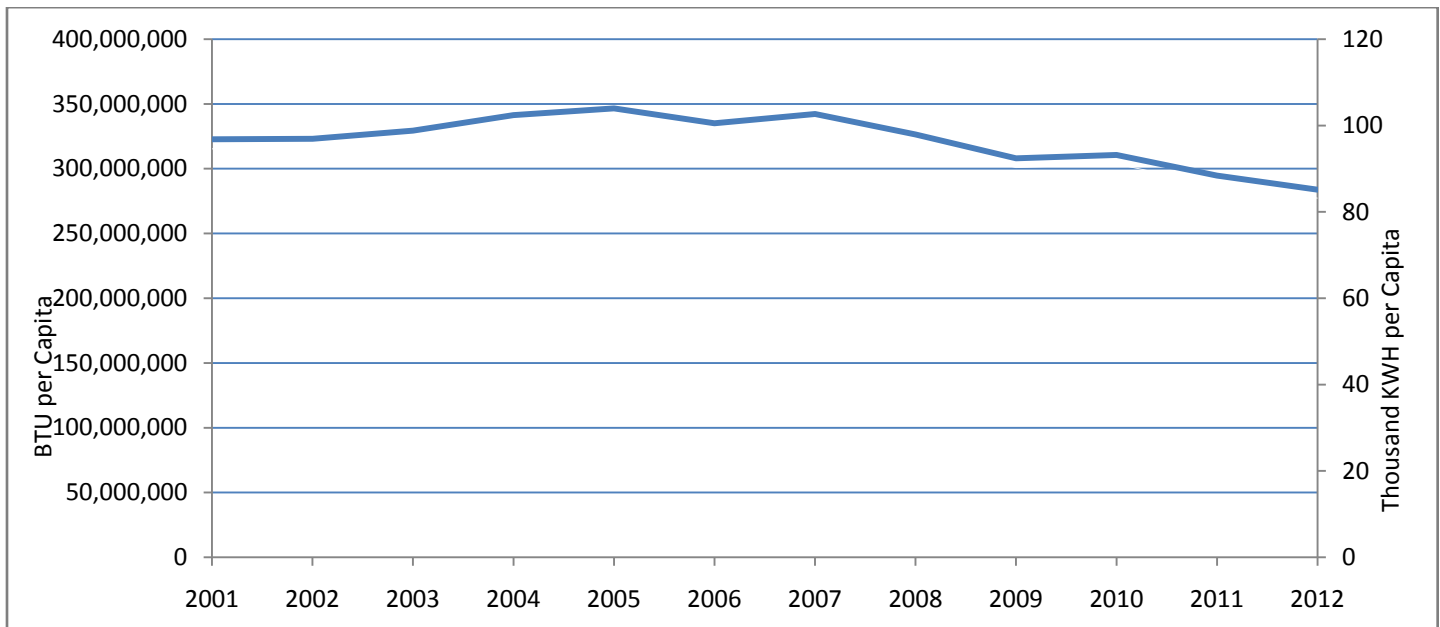
Virginia Residential Consumption, 2012



Energy use generally before 2005, over the long term, had increased gradually due to increases in energy used for transportation and as consumers used more energy-consuming devices in their homes and businesses. This long-term trend appears to have changed since about 2005. Since then, per capita energy use in the Commonwealth generally has decreased for a number of reasons, including the following: consumers are driving fewer miles per person; economic activity has been slow; and, energy efficiency improvements have been realized.

¹² EIA, SEDS, Virginia State Energy Profile

Figure 1-4: Virginia's Per Capita Energy Use, 2000-2012¹³



\$13.7 billion on imported fuels and electricity.

Energy Balance – Imports and Exports

- Virginia has a net negative energy balance, importing 55 percent of the total amount of energy the state uses.¹⁴ However, the SCC has rate setting jurisdiction over between 85 and 90 percent of total energy supplied to Investor Owned Utilities because some generation facilities outside of Virginia's geographical boundary are owned by utilities that serve Virginia customers. The Commonwealth is a net exporter of coal and a net importer of all other fuels.
- In 2009, Virginians spent \$26.74 billion to purchase energy.¹⁵ On a net basis, this included

¹³ EIA, SEDS, Virginia State Energy Profile

¹⁴ EIA, SEDS, Virginia State Energy Profile

¹⁵ EIA, SEDS, Virginia State Energy Profile

Figure 1-5: Virginia's Net Energy Imports/(Exports), 2012¹⁶
(Trillion BTUs)

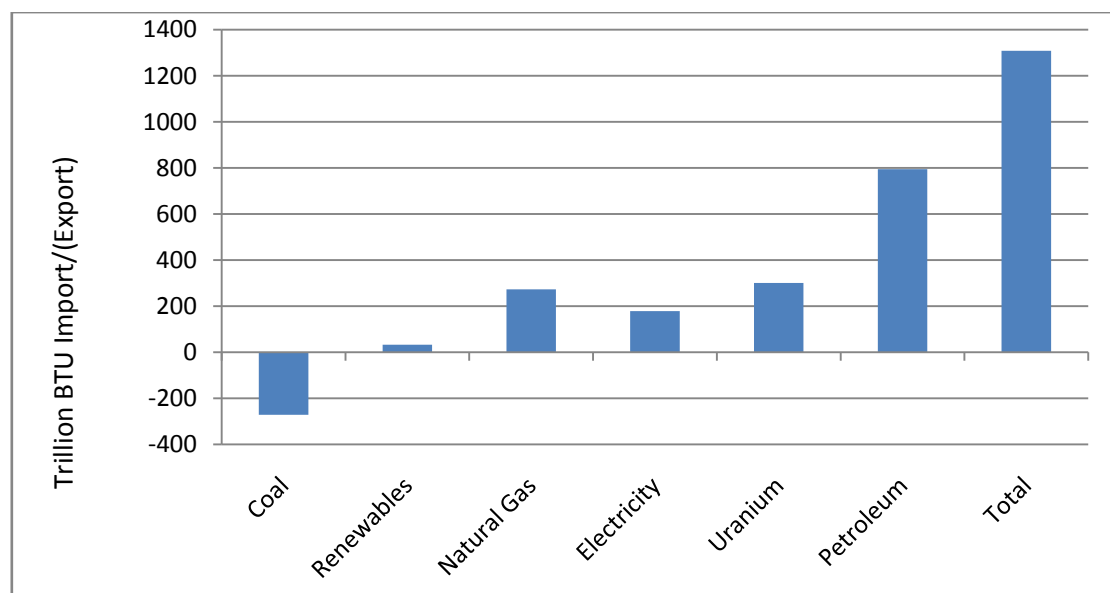


Table 1-1: Virginia's Estimated Net Energy Imports/(Exports), 2012¹⁷ (Trillion BTUs)

| Fuel | Production ¹⁸ | Consumption ¹⁹ | Net Imp/(Exp) |
|--|--------------------------|---------------------------|---------------|
| Coal | 493.4 | 222.2 | (271.2) |
| Renewables | 101.6 | 134.5 | 32.9 |
| Natural Gas | 151.4 | 424 | 272.6 |
| Electricity from nuclear ¹⁸ | 301 | 479.4 | 178.4 |
| Uranium (converted to Trillion Btu equivalent) ¹⁹ | 0 | 301 | 301 |
| Petroleum | 0.1 | 794.6 | 794.6 |
| Total | 1047.5 | 2355.7 | 1308.2 |

¹⁶ EIA, SEDS, Virginia State Energy Profile

¹⁷ EIA, SEDS, Virginia State Energy Profile

¹⁸ EIA, SEDS, Virginia State Energy Profile

¹⁹ EIA, SEDS, Virginia State Energy Profile

Figure 1-6: Virginia's Net Energy Imports/(Exports) by Fuel, 2000-2012¹⁸

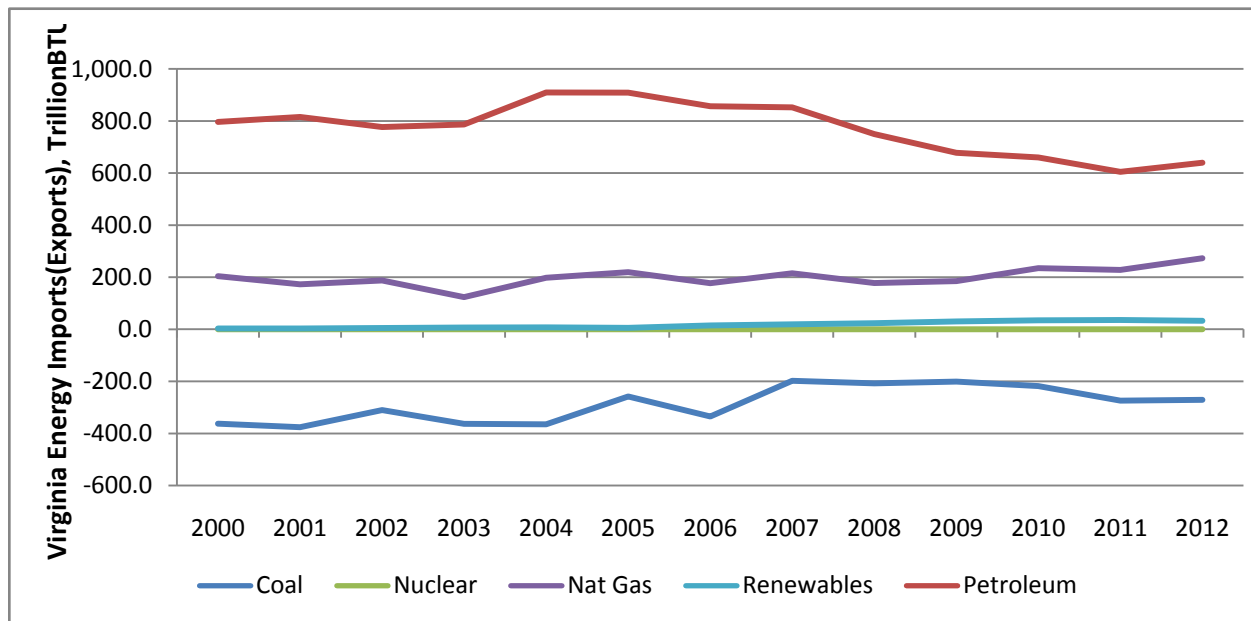


Table 1-2: Energy Production and Consumption History for Virginia (Trillion BTUs)¹⁹

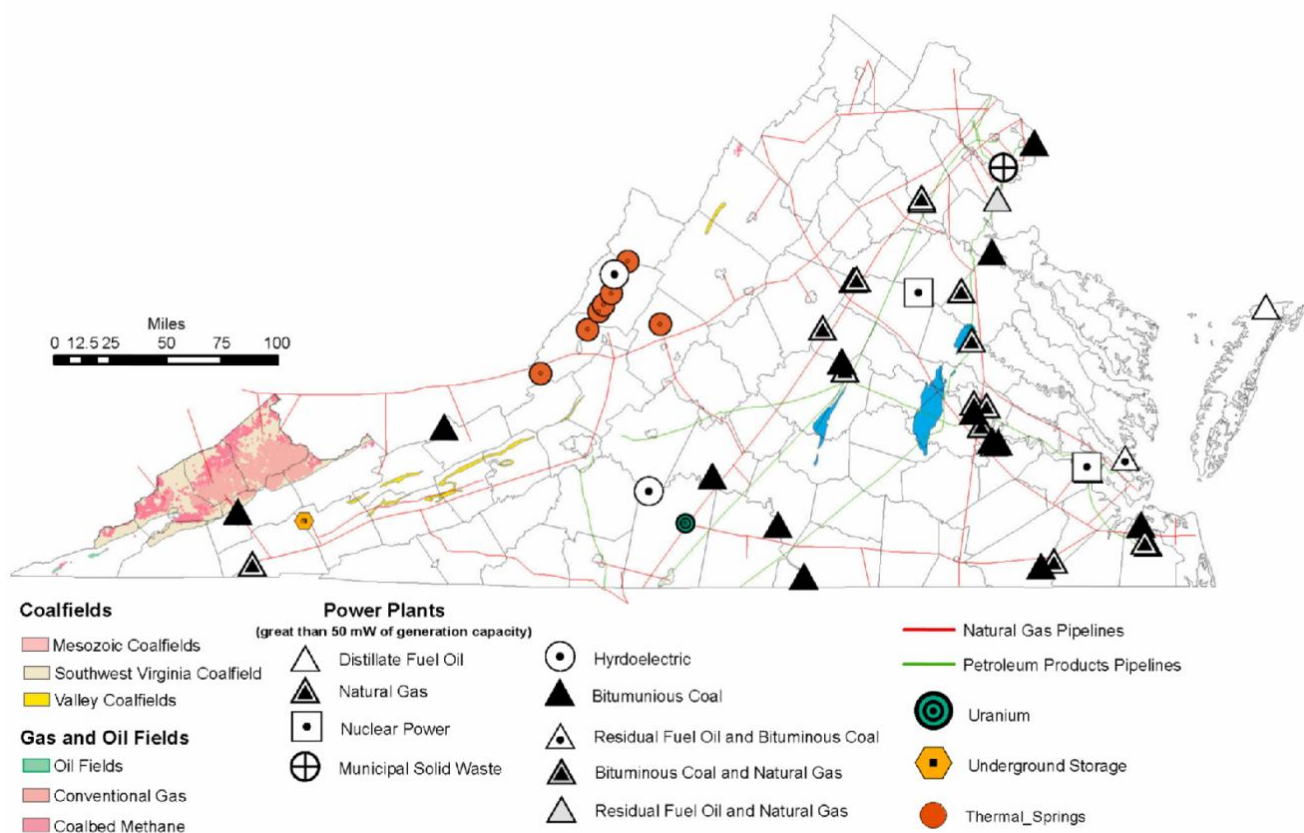
| Year | Consumption | Growth | Primary Production | Growth | Gap/Imports | Growth |
|------|-------------|--------|--------------------|--------|-------------|--------|
| 1995 | 2152.5 | | 1355.5 | | 797.0 | |
| 1996 | 2209.2 | 2.63% | 1415.7 | 4.44% | 793.5 | -0.4% |
| 1997 | 2205.5 | -0.17% | 1425.1 | 0.66% | 780.4 | -1.7% |
| 1998 | 2231.7 | 1.19% | 1374.5 | -3.55% | 857.2 | 9.8% |
| 1999 | 2290 | 2.61% | 1346 | -2.07% | 944.0 | 10.1% |
| 2000 | 2386.8 | 4.23% | 1353.9 | 0.59% | 1032.9 | 9.4% |
| 2001 | 2322.9 | -2.68% | 1300.1 | -3.97% | 1022.8 | -1.0% |
| 2002 | 2354.1 | 1.34% | 1235.7 | -4.95% | 1118.4 | 9.3% |
| 2003 | 2426.8 | 3.09% | 1339.7 | 8.42% | 1087.1 | -2.8% |
| 2004 | 2552 | 5.16% | 1312 | -2.07% | 1240.0 | 14.1% |
| 2005 | 2625.8 | 2.89% | 1227.1 | -6.47% | 1398.7 | 12.8% |
| 2006 | 2571.1 | -2.08% | 1281.9 | 4.47% | 1289.2 | -7.8% |
| 2007 | 2652.4 | 3.16% | 1175.2 | -8.32% | 1477.2 | 14.6% |
| 2008 | 2557.2 | -3.59% | 1166.3 | -0.76% | 1390.9 | -5.8% |
| 2009 | 2440.9 | -4.55% | 1091.7 | -6.40% | 1349.2 | -3.0% |
| 2010 | 2492.6 | 2.12% | 1097.2 | 0.50% | 1395.4 | 3.4% |
| 2011 | 2388.5 | -4.18% | 1087.8 | -0.86% | 1300.7 | -6.8% |
| 2012 | 2356.0 | -1.36% | 1047.4 | -3.71% | 1308.6 | 0.6% |

Energy Infrastructure

A robust infrastructure is needed to deliver affordable, reliable energy supplies to energy users. Virginia's energy infrastructure (see Figure 1-7) includes facilities required for:

- Electricity generation, transmission, and distribution
- Natural gas production, transmission, and storage
- Petroleum production, transportation, and distribution
- Coal mining, transportation, and export
- Propane transportation, and distribution
- Wood/biomass production and transportation

Figure 1-7: Virginia's Energy Infrastructure²⁰



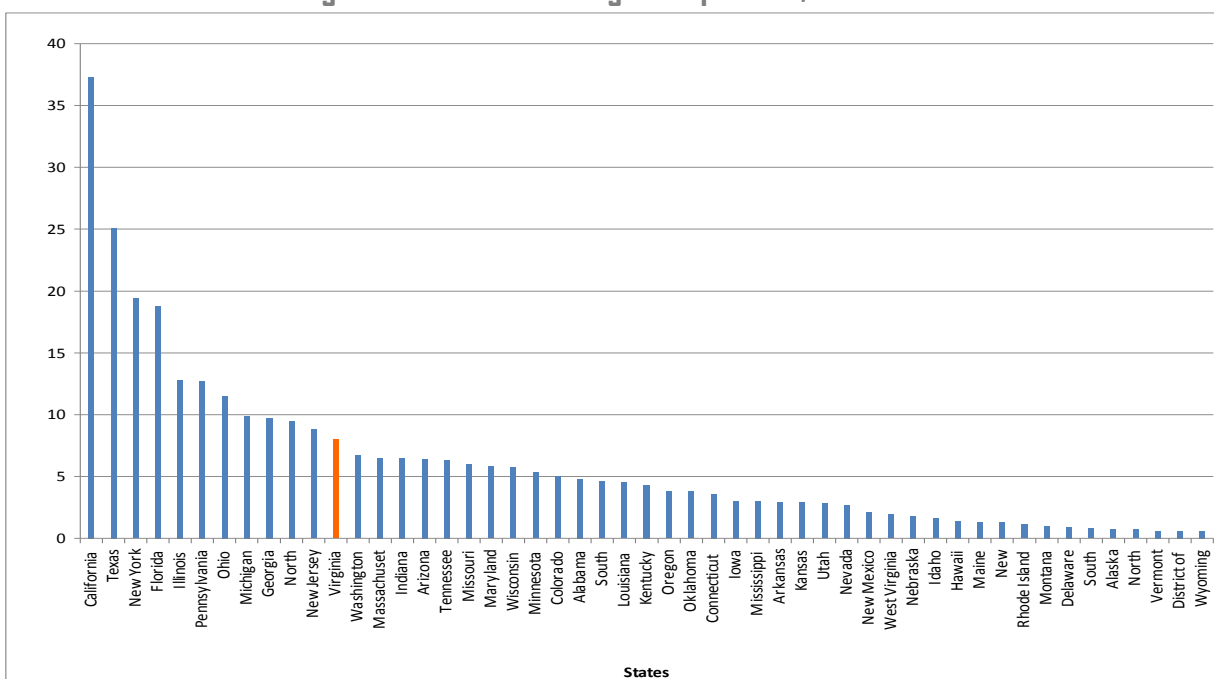
²⁰ EIA, SEDS, Virginia State Energy Profile

State Rankings

As shown in the following comparisons of states, the Commonwealth has an economy that ranks among the top tier of states, while using energy more efficiently than the majority of states.

- According to the 2010 U.S. Census, Virginia was home to 8.0 million people, the 12th largest of the states.²¹
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Figure 1-8: State Rankings – Population, 2011²²



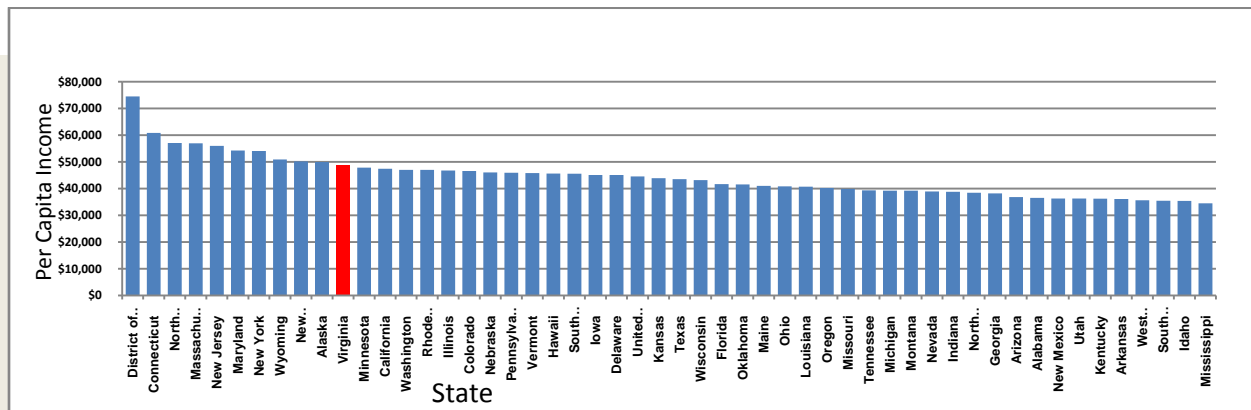
- In 2013, Virginia's per capita personal income was \$48,773, the 11th highest of the states (including the District of Columbia).²³

²¹ EIA, SEDS, Virginia State Energy Profile

²² EIA, SEDS, Virginia State Energy Profile

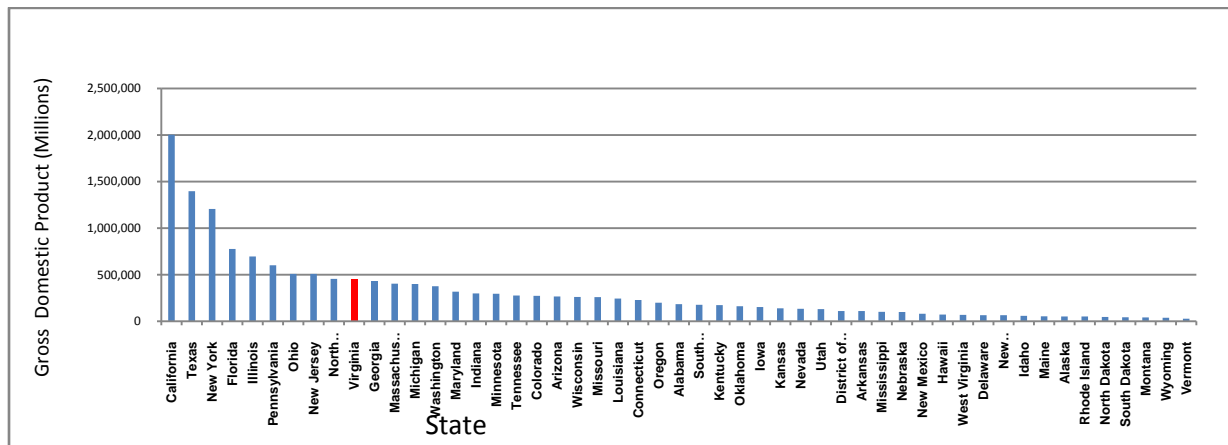
²³ Ibid

Figure 1-9: State Rankings – Per Capita Income, 2013²⁴



- In 2013, Virginia's gross domestic product (GDP) was \$445,876 billion - making it the 10th largest state economy of the nation.²⁵

Figure 1-10: State Rankings – Gross Domestic Product, 2013²⁶



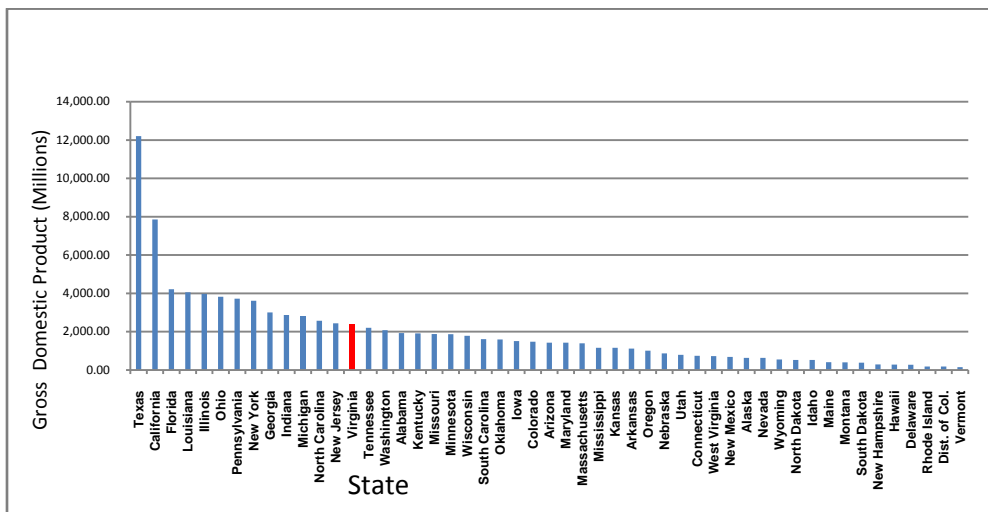
²⁴ EIA, SEDS, Virginia State Energy Profile

²⁵ EIA, SEDS, Virginia State Energy Profile

²⁶ EIA, SEDS, Virginia State Energy Profile

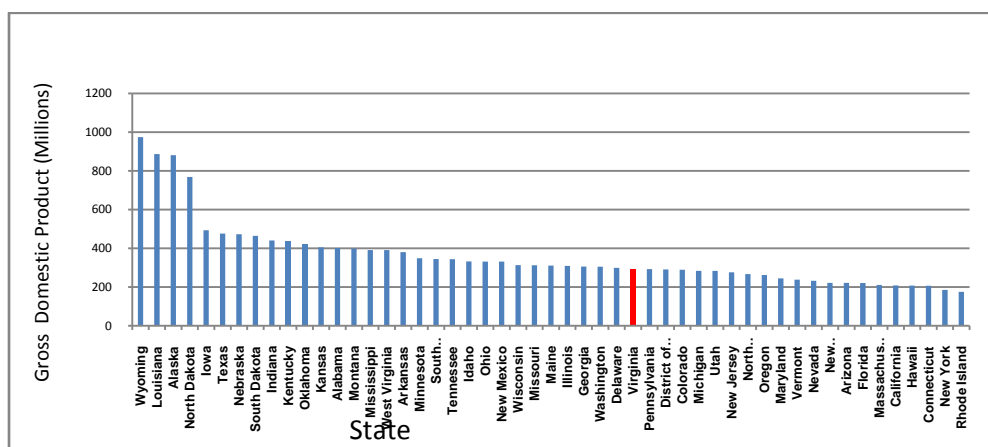
- In 2011, Virginia ranked 14th in total energy consumption, using 2,386 trillion Btu's of energy, or 2.5 percent of the total energy used in the U.S.²⁷

Figure 1-11: State Rankings - Total Energy Consumption, 2011²⁸



- In 2009, Virginia ranked 29th in energy use per capita among the states, using 303 million Btu's per person, 5 million Btu's less than the national average.²⁹

Figure 1-12: State Rankings - Energy Use Per Capita, 2011³⁰



²⁷ EIA, SEDS, Virginia State Energy Profile

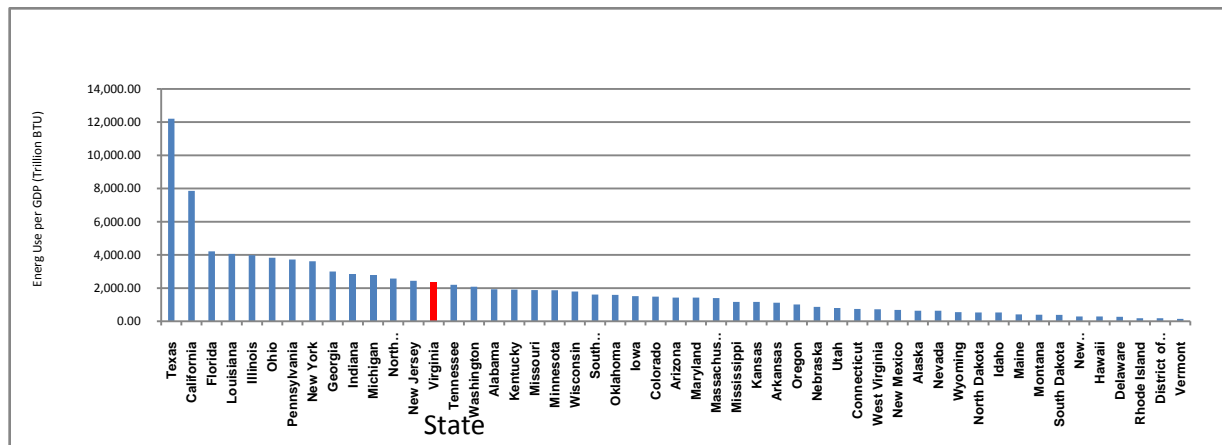
²⁸ EIA, SEDS, Virginia State Energy Profile

²⁹ EIA, SEDS, Virginia State Energy Profile

³⁰ EIA, SEDS, Virginia State Energy Profile

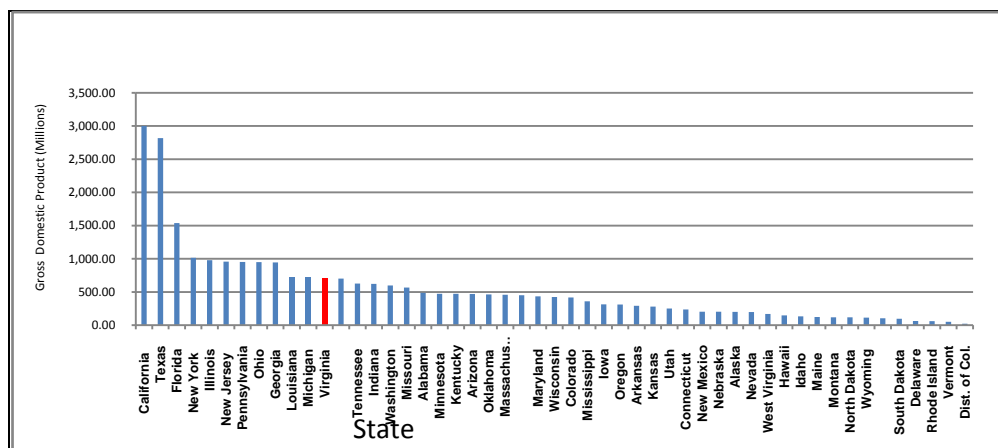
In 2011, Virginia ranked 14th, behind New Jersey, in energy use per gross domestic product (GDP), using 6,500 BTUs per dollar of GDP. This is slightly below the U.S. average of 7,300 BTUs per dollar of GDP.³¹

Figure 1-13: State Rankings - Energy Use Per Real Dollar of Gross Domestic Product (GDP), 2011³²



- In 2009, Virginians used 745,455 billion BTU of energy for transportation. This was greater than for any other sector, ranking Virginia 10th amongst the states in terms of total energy used for transportation.³³

Figure 1-14: State Rankings - Energy Use for Transportation, 2011³⁴



³¹ EIA, SEDS, Virginia State Energy Profile

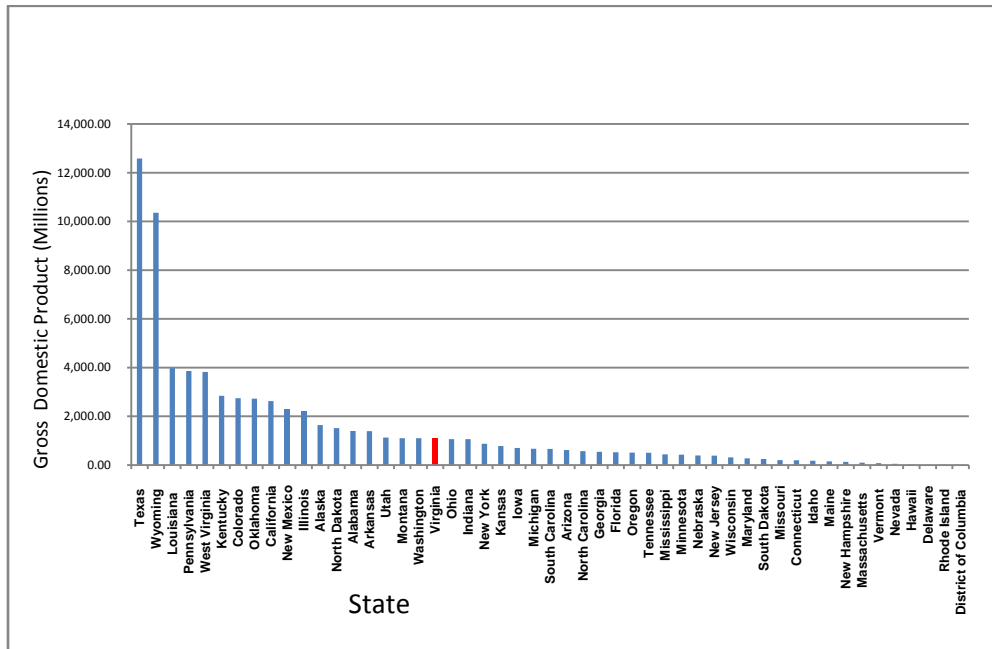
³² EIA, SEDS, Virginia State Energy Profile

³³ EIA, SEDS, Virginia State Energy Profile

³⁴ EIA, SEDS, Virginia State Energy Profile

- In 2009, Virginia produced 1,092 trillion Btu, ranking it 15th among the states in terms of total energy production.³⁵

Figure 1-15: State Rankings – In-State Energy Production, 2011³⁶



³⁵ EIA, Sources and Uses

³⁶ EIA, Sources and Uses